

The Massachusetts Response to Zika Virus

Public Health Council

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Core concepts

2016

Massachusetts Arbovirus Surveillance and Response Plan

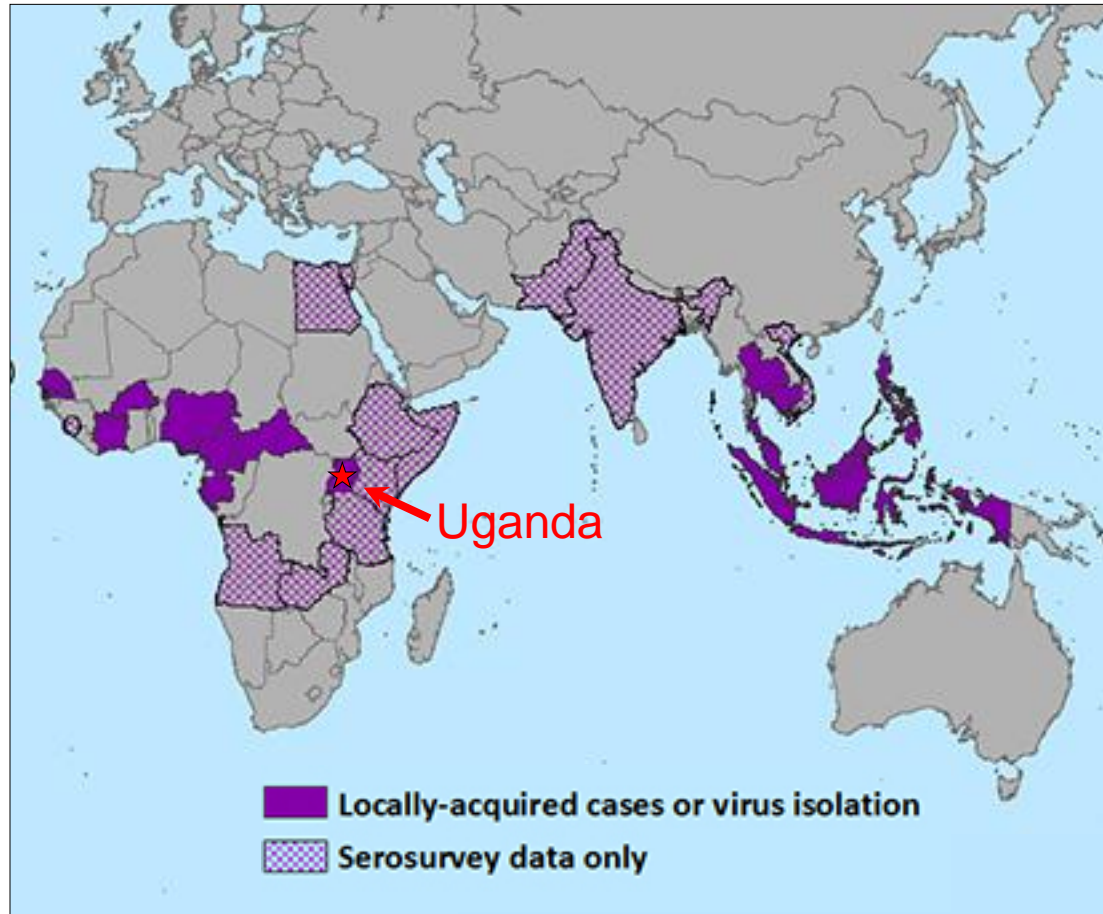
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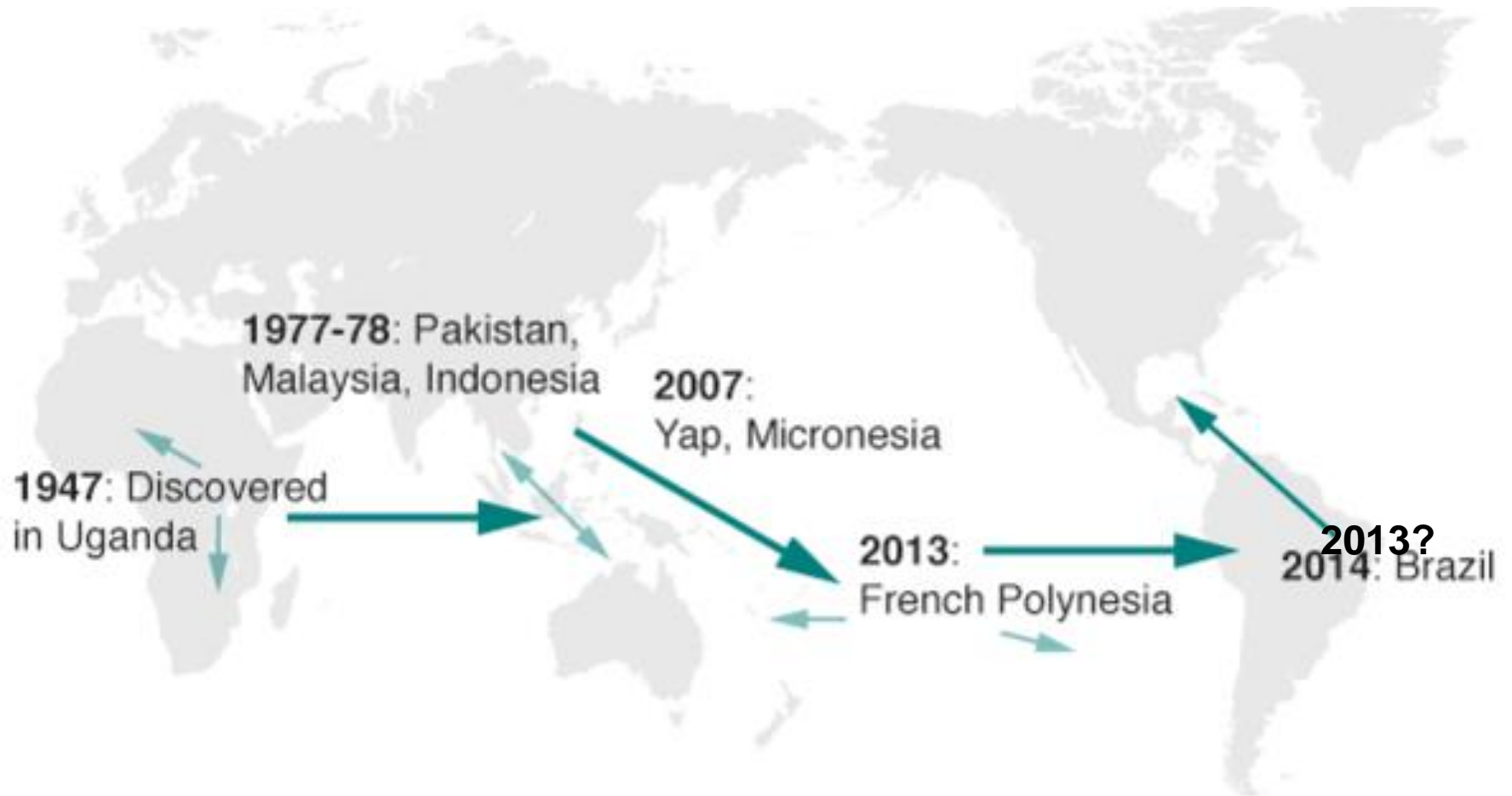
- EEE and WNV are annual realities in Massachusetts addressed using well-documented protocols.
- Massachusetts has had the longest experience with EEE in the nation, and is one of two states with the largest number of cases.
- The original EEE surveillance and response plan was adapted to include WNV when it was introduced
- Plan robust enough to include the foundations of surveillance for, and response to, emerging arboviruses and non-native mosquitoes

Original Geographic Range, 1947-2006

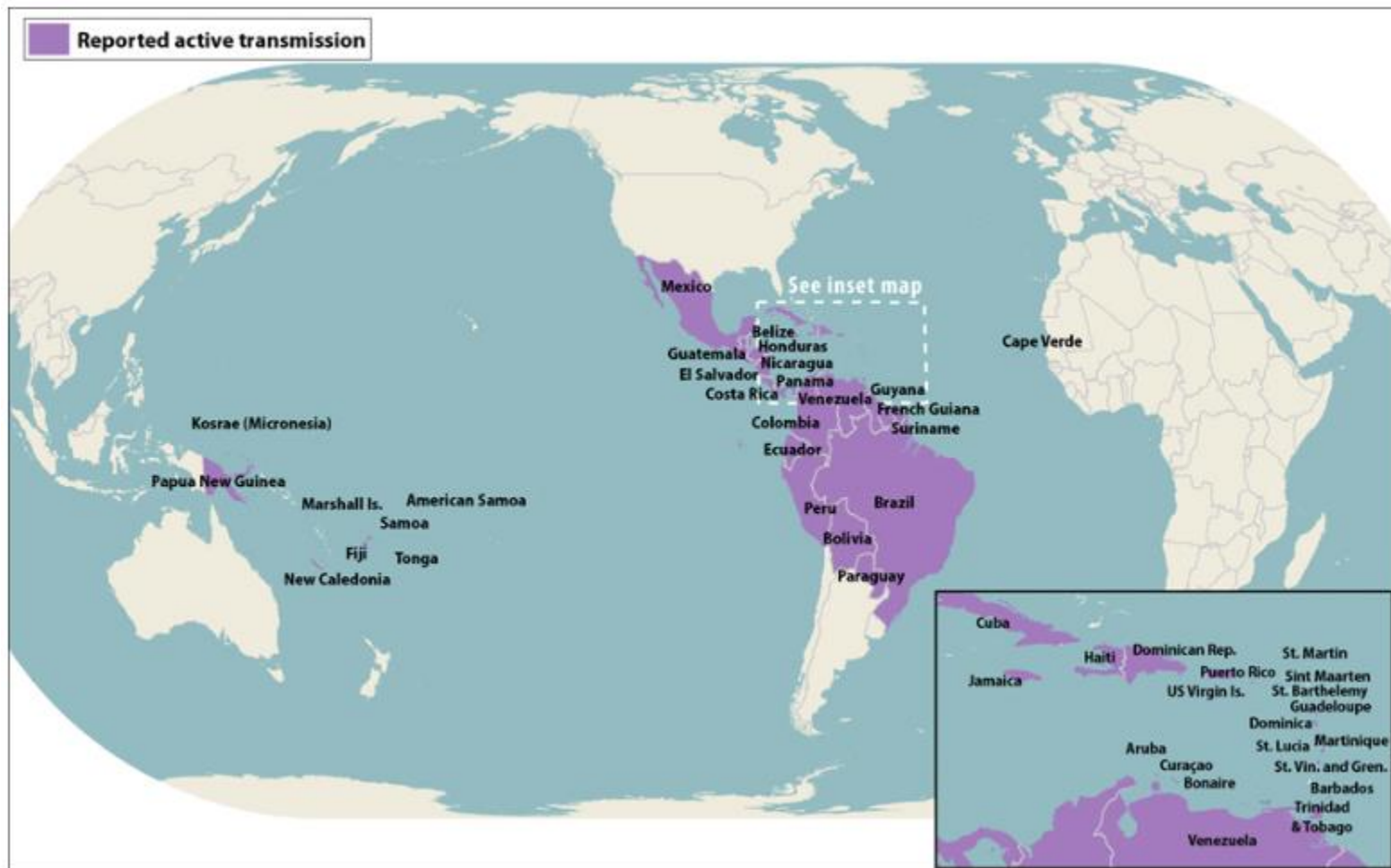


The mosquito species implicated as predominant Zika vectors in both Africa and Asia are:
Aedes aegypti
Aedes albopictus

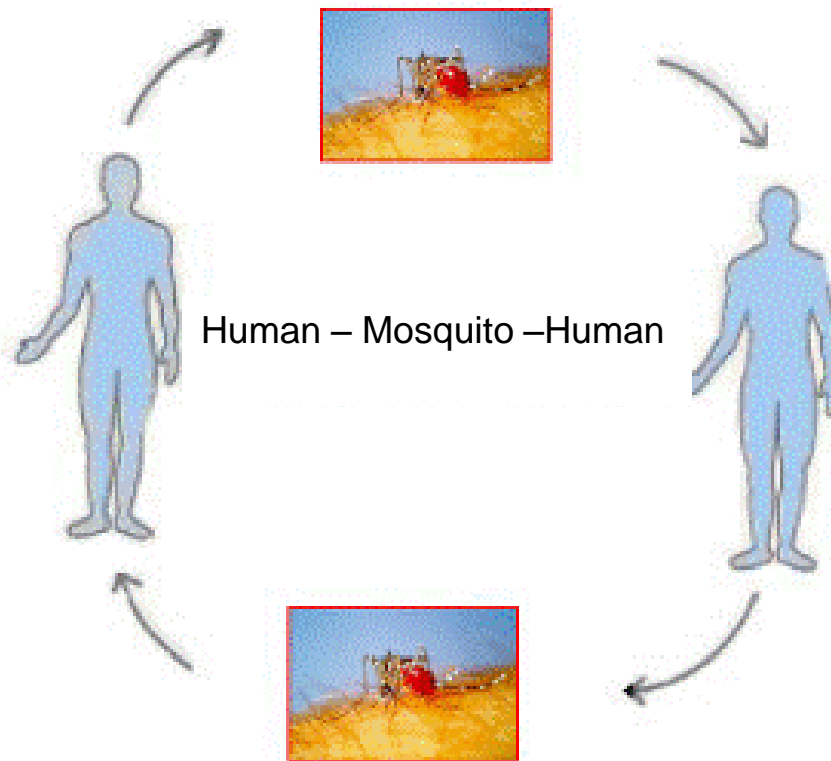
Spread of Zika Virus



www.cdc.gov/zika



Zika Transmission Cycle





Aedes aegypti

Natural plant containers



Rain-filled cavities in trees, bamboo internodes, leaf-axils of plants



Aedes albopictus

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Artificial containers

Containers that are filled with rain water



Large discarded containers (tires, damaged appliances) and small discarded containers (paint cans)

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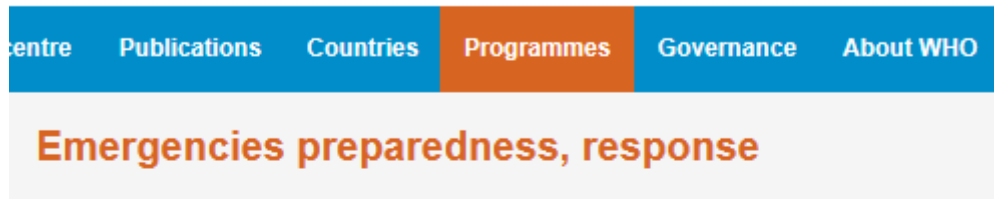
Trash cans, pails or buckets, painting trays, toys

Zika Symptoms

- 80% of people will develop no symptoms
- 2-7 day duration of illness
- Self-limiting – no treatment required
- Severe disease with hospitalization is rare
- Symptoms:
 - Fever
 - Maculopapular rash, may be itchy
 - Joint pain with swelling, often in the extremities
 - Conjunctivitis (inflammation of the white part of the eye)

Identified Potential Complications of Zika

Fetal losses and birth defects, including microcephaly
Post infectious complication – Guillain-Barré Syndrome



Microcephaly – Brazil

Disease Outbreak News
20 November 2015

In October 2015, the Ministry of Health (MoH) of Brazil notified PAHO/WHO of an unusual increase in the number of cases of microcephaly among newborns in the state of Pernambuco, northeastern Brazil.

As of 17 November, a total of 399 cases of microcephaly were being investigated in seven states in the northeast of Brazil. Most of the cases were registered in Pernambuco state (268). Other states that reported microcephaly cases are Sergipe (44), Rio Grande do Norte (39), Paraíba (21), Piauí (10), Ceará (9) and Bahia (8).



AP Photo/Felipe Dana

Potential Sexual Transmission of Zika Virus

Didier Musso, Claudine Roche, Emilie Robin, Tuxuan Nhan, Anita Teissier, Van-Mai Cao-Lormeau

In December 2013, during a Zika virus (ZIKV) outbreak in French Polynesia, a patient in Tahiti sought treatment for hematospermia, and ZIKV was isolated from his semen. ZIKV transmission by sexual intercourse has been previously suspected. This observation supports the possibility that ZIKV could be transmitted sexually.

semen confirmed hematospermia. We extracted RNA using the NucliSENS easyMAG system (bioMérieux, Marcy l'Etoile, France) from 200 μ L of blood and from 500 μ L of semen and urine; both were eluted by 50 μ L of elution buffer. We used 5 μ L of RNA extracted for amplification. We tested blood and semen RNA extracts using real-time reverse transcription PCR (rRT-PCR) as described using

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Probable Non-Vector-borne Transmission of Zika Virus, Colorado, USA

Brian D. Foy, Kevin C. Kobylinski, Joy L. Chilson Foy, Bradley J. Blitvich, Amelia Travassos da Rosa, Andrew D. Haddow, Robert S. Lanciotti, and Robert B. Tesh

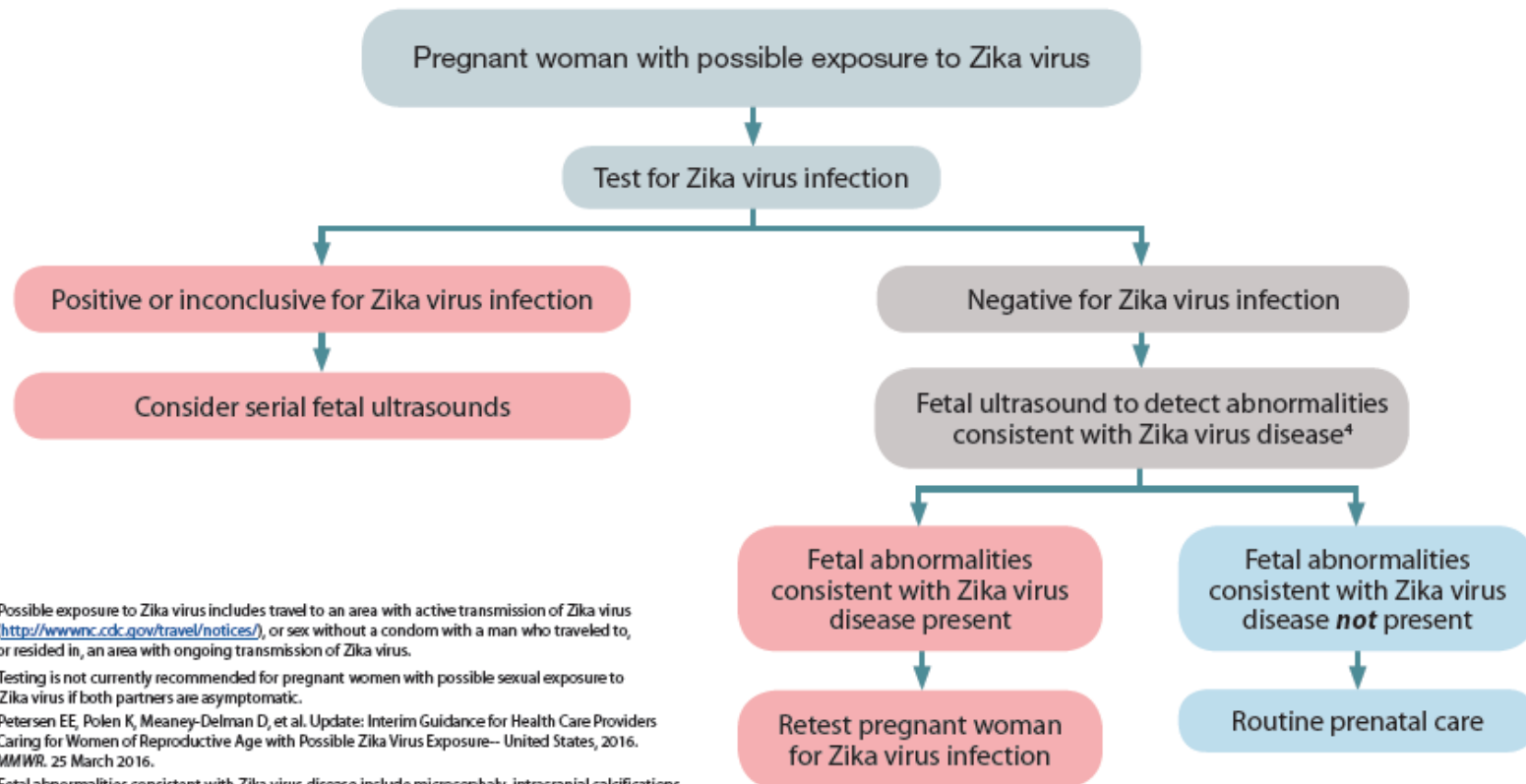
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Clinical and serologic evidence indicate that 2 American scientists contracted Zika virus infections while working in Senegal in 2008. One of the scientists transmitted this arbovirus to his wife after his return home. Direct contact is implicated as the transmission route, most likely as a sexually transmitted infection.

Current Recommendations for Pregnant Women

- **Women that are pregnant or trying to become pregnant should avoid travel to areas with known Zika virus transmission** OR be vigilant about avoiding mosquito bites
- Test pregnant women with travel to an area with known Zika virus transmission whether or not they reported symptoms

Testing Algorithm for a Pregnant Woman with Possible Exposure to Zika Virus^{1,2}, Not Residing in an Area with Active Zika Virus Transmission³



¹Possible exposure to Zika virus includes travel to an area with active transmission of Zika virus (<http://www.cdc.gov/travel/notices/>), or sex without a condom with a man who traveled to, or resided in, an area with ongoing transmission of Zika virus.

²Testing is not currently recommended for pregnant women with possible sexual exposure to Zika virus if both partners are asymptomatic.

³Petersen EE, Polen K, Meaney-Delman D, et al. Update: Interim Guidance for Health Care Providers Caring for Women of Reproductive Age with Possible Zika Virus Exposure-- United States, 2016. *MMWR*. 25 March 2016.

⁴Fetal abnormalities consistent with Zika virus disease include microcephaly, intracranial calcifications, and brain and eye abnormalities. Fetal ultrasounds might not detect abnormalities until late second or early third trimester of pregnancy.

Updated Interim Guidelines and other resources for healthcare providers available at
<http://www.cdc.gov/zika/hc-providers/index.html>

www.cdc.gov/zika



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Guidance on Timing of Pregnancy and Prevention of Sexual Transmission

Updated interim guidance for women of reproductive age and sexually active men	
Symptomatic women diagnosed with Zika virus or experiencing symptoms of possible exposure	8 weeks after symptom onset before trying to get pregnant
Symptomatic men diagnosed with Zika virus or experiencing symptoms of possible exposure	6 months after symptom onset before having unprotected sex
Asymptomatic men and women with possible exposure to Zika virus from recent travel or sexual contact	8 weeks after possible exposure before trying to get pregnant, men should wear a condom during all sexual contact
Asymptomatic men and women who live in an area with active Zika transmission	CDC recommends healthcare providers talk with their patients about pregnancy plans

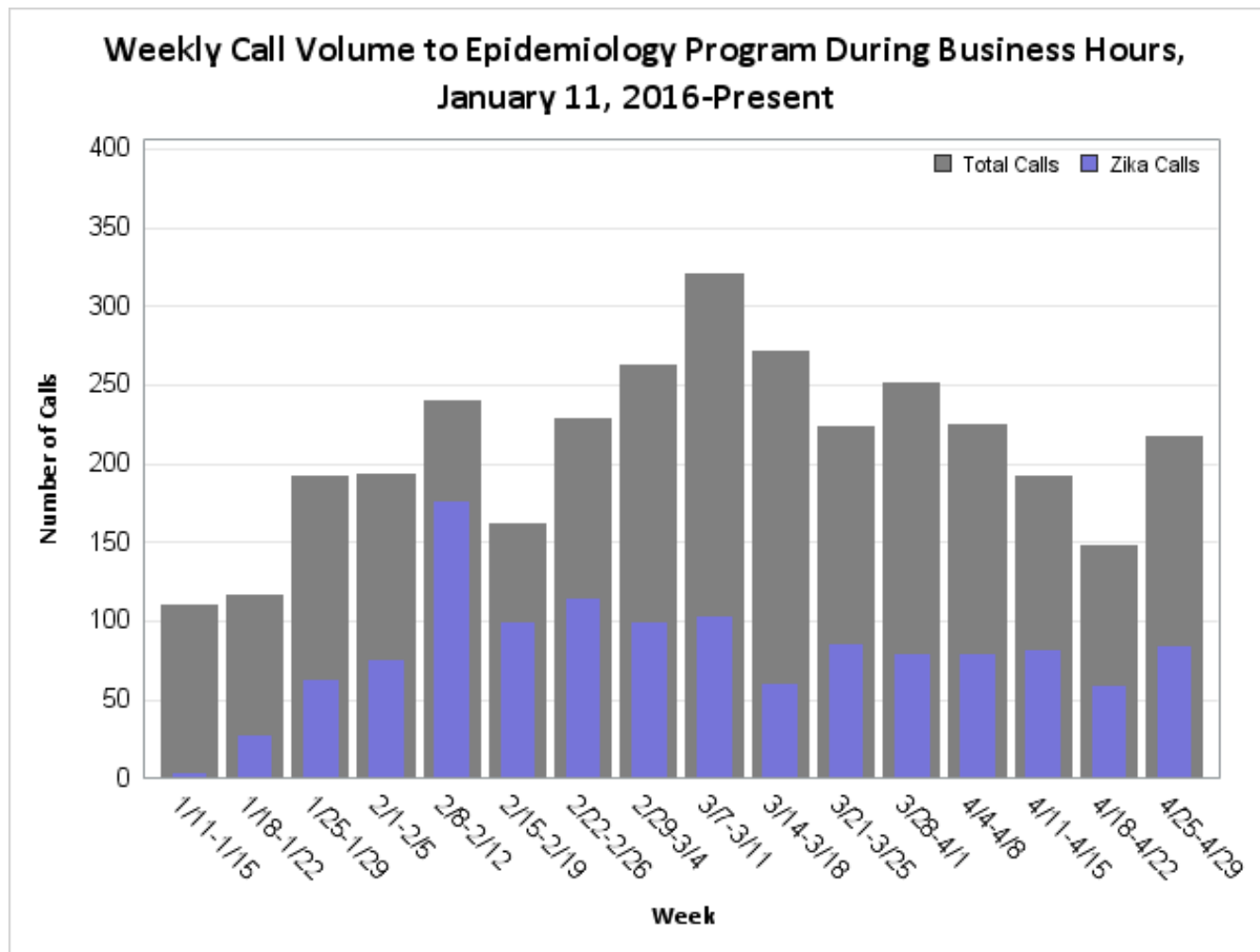
Questions Still Being Investigated

- Why has microcephaly been reported more from some places than other?
- When is maternal infection most risky?
- How often does infection of the fetus occur?
- Are there co-factors that precipitate the birth defects/fetal losses?
- How often is Zika virus found in semen?
 - How long can it be found there?
 - How common is sexual transmission?

DPH Coordination with Providers

- Working with Providers and Hospitals
 - to identify pregnant women with possible Zika virus exposure and test them in order to either rule out infection or to provide the information about the evidence of infection to the healthcare provider so they can make monitoring and management decisions with their patient
 - to test samples any time a woman with potential exposure to Zika virus has an unexpected or poor birth outcomes

Calls to 24/7 MDPH Epidemiology Line

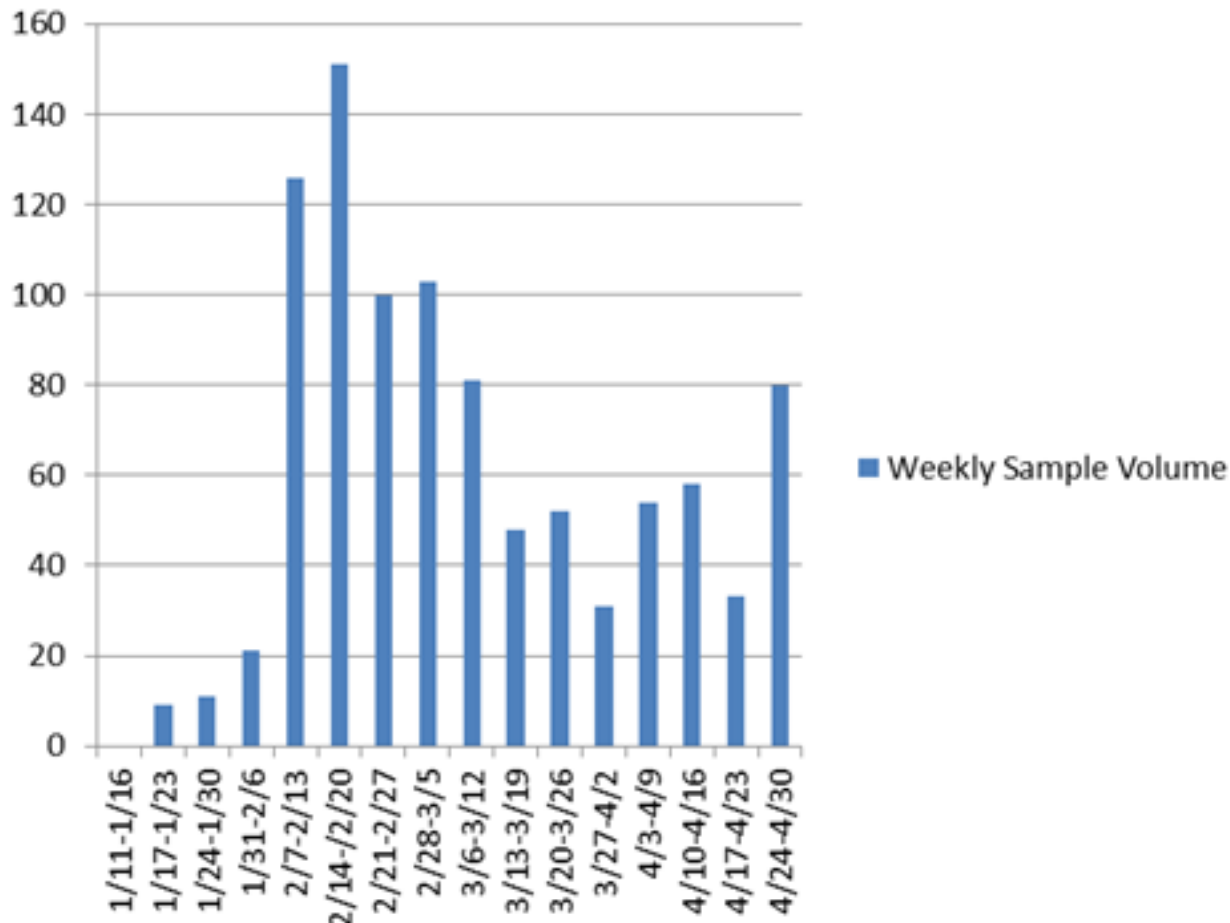


Testing Capacity at MDPH

- MA State Public Health Laboratory rapidly implemented Zika virus testing
- Zika virus testing issues
 - Significant cross-reactivity with other flaviviruses (dengue, WNV, yellow fever)
 - Antibody testing is complex and difficult to interpret, confirmation required at CDC
 - Limiting it to protect the most vulnerable population

Samples Submitted to MSPHL

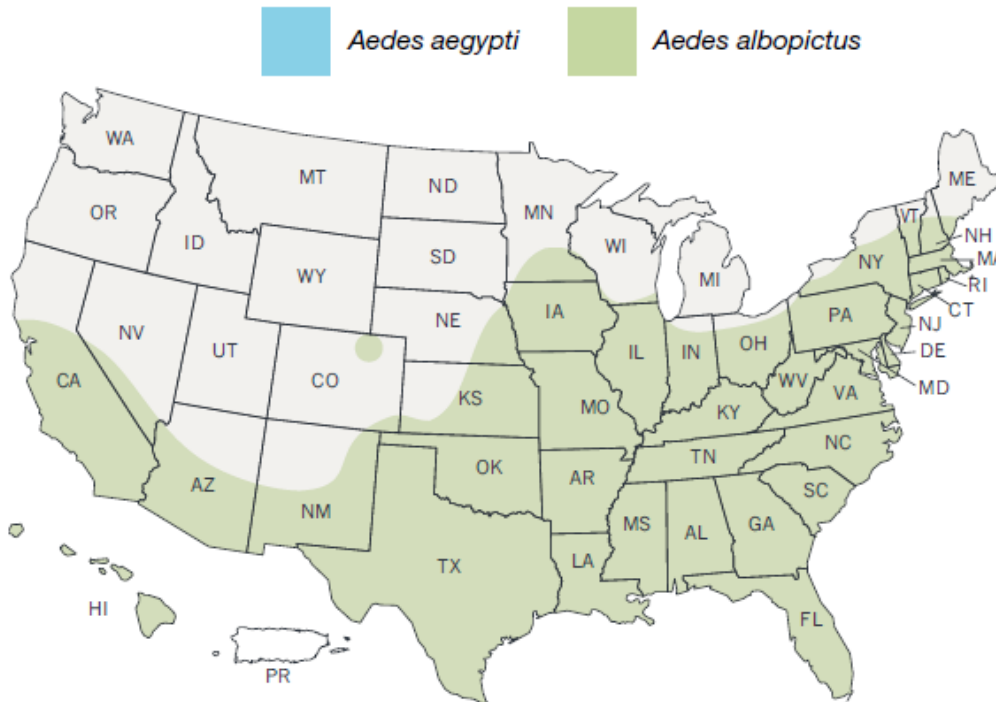
**Weekly Volume of Samples Submitted to
MA SPHL for Zika Virus Testing**



Includes testing provided for the NH State Public Health Laboratory as part of a regional public health laboratory cooperative initiative

MDPH Birth Defects Surveillance

- Coordinating with Birth Defects surveillance
 - Microcephaly occurring in ~1.5 births per every 10,000. (Expectation of 10-15 babies born per year).
 - Causes of microcephaly include genetic abnormalities, infection with certain viruses such as cytomegalovirus, rubella, toxoplasmosis and varicella, severe malnutrition, and exposure to alcohol or drugs.
 - Assisting with medical chart review for mothers and infants with evidence of Zika virus exposure



- Exact locations or numbers of mosquitoes living in an area
- Risk or likelihood that these mosquitoes will spread viruses

- CDC's best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States
- Areas where mosquitoes are or have been previously found

Additional Mosquito Surveillance

- Coordinating with MCPs to identify areas that may be at risk for *Aedes albopictus* introduction
 - Surveillance in those areas
- Incorporating public health recommendations for response to identifications of *Aedes albopictus* into Surveillance and Response Plan
- Communication with LHDs

Aedes albopictus Surveillance



An Interagency Effort: Arbovirus Surveillance and Response

- **Executive Office of Health and Human Services**
 - Department of Public Health
 - Bureau of Infectious Disease and Laboratory Sciences
 - Bureau of Environmental Health
- **Executive Office of Energy and Environmental Affairs**
 - State Reclamation and Mosquito Control Board
 - Department of Agricultural Resources
 - Department of Conservation and Recreation
 - Department of Environmental Protection
- **Local Mosquito Control Projects**
- **Local Health Departments**

Personal Prevention for Travelers

Take steps to prevent mosquito bites.

- Be aware that these mosquito vectors are active during the day
- Wear long-sleeved shirts and long pants.
- Stay in places with air conditioning and window and door screens to keep mosquitoes outside.
- Use Environmental Protection Agency (EPA)-registered insect repellents. When used as directed, these insect repellents are proven safe and effective even for pregnant and breastfeeding women.
- Remove or stay away from mosquito breeding sites, like containers with standing water.